

EXHIBIT B



**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

**IN RE METHYL TERTIARY BUTYL ETHER ("MTBE")
PRODUCTS LIABILITY LITIGATION**

Master File No. 1:00-1898
MDL 1358 (SAS)
M21-88

This document pertains to:

**City of New York v. Amerada Hess Corp., et al.
04 Civ. 3417**

EXPERT REPORT OF ROBERT N. STAVINS

ROBERT N. STAVINS

1/23/09

January 23, 2009

I. Qualifications

1. I am the Albert Pratt Professor of Business and Government and Chairman of the Environment and Natural Resources Faculty Group at the John F. Kennedy School of Government, Harvard University, and Director of the Harvard Environmental Economics Program. The role of economic analysis in environmental policymaking has been a focus of my research and my public policy engagement with federal and state governments. I am a former Chairman of the U.S. Environmental Protection Agency's (EPA) Environmental Economics Advisory Committee, which provides expert advice to the EPA Administrator on economic issues related to environmental decision making. I was appointed Chairman by Administrator Carol Browner during the Clinton Administration and re-appointed Chairman by Administrator Christie Todd Whitman during the George W. Bush Administration. As Chairman, I directed the review of EPA's revised *Guidelines for Preparing Economic Analyses*, EPA's guidance document for development of regulatory impact analyses (RIAs) of EPA rulemakings. As Chairman, I also directed reviews of EPA's methods of economic analysis. At Harvard, I teach courses that address the theory, method, and practice of benefit-cost analysis. A more detailed description of my background and credentials, including a list of my publications during the past ten years, is contained in the attached copy of my curriculum vitae in Appendix A. Appendix B lists the cases in which I have testified at trial or in deposition during the past four years.

2. I have been asked to examine the statutory and regulatory record regarding EPA's Reformulated Gasoline (RFG) Program, drawing on my expertise in the analysis of environmental policymaking and particularly the use of RIAs in the development of environmental regulations. I have been asked to give my opinion – based on my examination of this record – regarding EPA's expectations about oxygenate use in RFG, and what role, if any, those expectations played in EPA's development and assessment of the RFG standards. I previously submitted two reports on these issues in a related case.¹ My opinions from those

¹ Expert Report of Robert N. Stavins, *County of Suffolk and Suffolk County Water Authority v. Amerada Hess Corp., et al.*, February 28, 2007 (hereafter "February 2007 Stavins Report"); Rebuttal Report of Robert N. Stavins, *County of Suffolk and Suffolk County Water Authority v. Amerada Hess Corp., et al.*, April 25, 2007 (hereafter "April 2007 Stavins Report").

reports remain unchanged. I have also been asked to examine a report submitted by Mr. Martin Tallett on behalf of the Plaintiff in which he discussed some of my opinions from my earlier reports.² I respond to some of Mr. Tallett's comments in this report. Note that many subjects addressed by Mr. Tallett are beyond the scope of my investigations. Therefore, the fact that I do not address certain opinions by Mr. Tallett should not be interpreted as an indication that I agree with those opinions. Moreover, I understand that Mr. Tallett has not yet been deposed. I therefore reserve my right to review and respond to any material or opinions offered by Mr. Tallett in the future.

3. I have also been asked to examine the reports submitted by Mr. Gary Herwick and Dr. Ed Whitelaw on behalf of the Plaintiff³ and the recent literature on the social benefits and costs of corn-based ethanol production and use.⁴ I have been asked to comment on factors that should be considered in a social benefit-cost analysis and to evaluate the extent to which the reports of Mr. Herwick, Mr. Tallett, and Dr. Whitelaw consider those factors in their analyses of ethanol use in RFG.⁵ I have not been asked to conduct an independent benefit-cost analysis of ethanol use in RFG. Such an analysis is outside the scope of this report. In addition, many subjects addressed by Mr. Herwick, Mr. Tallett, and Dr. Whitelaw are beyond the scope of my investigations. Therefore, the fact that I do not address certain opinions by these experts should not be interpreted as an indication that I agree with those opinions. Moreover, I understand that these experts have not yet been deposed. I therefore reserve my right to review and respond to any material or opinions offered by them in the future.

² Expert Report of Martin R. Tallett, *City of New York v. Amerada Hess Corp., et al.*, December 19, 2008 (hereafter "December 2008 Tallett Report"). Mr. Tallett also previously submitted a report on these issues in a related case. Expert Report of Martin R. Tallett, *County of Suffolk and Suffolk County Water Authority v. Amerada Hess Corp., et al.*, June 8, 2007 (hereafter "June 2007 Tallett Report"). Mr. Tallett refers to his June 2007 report in his December 2008 report. I comment directly on the June 2007 report in Section III. D. of this report.

³ Expert Report of Gary A. Herwick, *City of New York v. Amerada Hess Corp., et al.*, December 19, 2008 (hereafter "Herwick Report"); Expert Report of Ed Whitelaw, *City of New York v. Amerada Hess Corp., et al.*, December 19, 2008 (hereafter "Whitelaw Report").

⁴ Hereafter, when I refer to ethanol I implicitly mean corn-based ethanol. According to the EPA, "Approximately 92 percent of today's ethanol production capacity is produced exclusively from corn, mainly from a dry-milling process." U.S. EPA, *Regulatory Impact Analysis: Renewable Fuel Standard Program*, EPA420-R-07-004, April 2007, p. 20 (hereafter "RFS RIA").

⁵ Hereafter, when I refer to benefit-cost analysis I implicitly mean social benefit-cost analysis. In other words, I am referring to an analysis that includes social benefits and costs, not just private benefits and costs. I discuss this in more detail in Section II.B. and Section IV.A.

4. As part of my work in this case, I have studied various documents that pertain to the development and implementation of EPA's RFG program, including materials in the docket for EPA's RFG rulemaking. I have also studied various documents that pertain to the benefits and costs of ethanol production and use, including more recent EPA reports and academic literature. A list of the documents that I have considered in forming my opinions in this case is provided in Appendix C.

5. My work is ongoing, and I may update and revise my conclusions.

6. I am being compensated for my work in this case at the rate of \$750 per hour. Part of the work for this investigation was performed by others working under my direction.

7. Based on my expertise, as described above, and my review of the materials listed in Appendix C, I have reached the following conclusions, which I discuss in the sections below.

II. Summary of Opinions

A. Summary of Opinions on EPA's Development and Assessment of the RFG Standards

8. **Final RFG standards were not published in the Federal Register until 1994.** While the Clean Air Act Amendments of 1990 (CAAA) established a framework for the RFG program, they did not establish all of the specific RFG standards. Rather, Congress set minimum requirements and directed EPA to set specific standards that would require the greatest emission reductions achievable, taking into consideration costs, energy requirements, and other factors. EPA's final RFG standards were published in the Federal Register in February 1994.

9. **EPA explicitly anticipated widespread MTBE use in RFG.** Required by statute to consider the environmental, economic, and energy implications of its RFG standards, EPA set those standards so as to strike a balance among their environmental benefits, economic costs, and energy impacts. EPA found that its chosen standards were appropriate based on analyses of the standards' environmental, economic, and energy implications in which EPA explicitly anticipated widespread use of methyl tertiary butyl ether (MTBE) in RFG.

10. EPA's expectation of MTBE use fundamentally affected its assessment of the RFG standards. Ethanol and MTBE differ in many respects, including their effects on the emissions targeted by the RFG standards. Through its RFG standards, EPA sought to reduce toxics emissions year-round and to reduce gasoline volatility during the summertime. Ethanol-blended RFG achieves fewer toxics reductions than does MTBE-blended RFG. Moreover, ethanol significantly increases gasoline volatility, while MTBE does not. To offset ethanol's volatility effect, refiners must modify their gasoline, which requires capital investments, increases refining costs, and reduces the volume of RFG that they can produce. The adverse economic and energy consequences associated with offsetting ethanol's volatility effect are avoided by using MTBE in RFG. As a result of these differences between ethanol and MTBE, the balance among the RFG standards' environmental, economic, and energy implications that EPA struck depended on EPA's presumption of widespread MTBE use. That balance would have been fundamentally altered by the exclusive use of ethanol in RFG.

11. According to EPA's analysis, the Phase I volatile organic compound (VOC) emission standards were unachievable using only ethanol. EPA's own assessment indicated that, because of ethanol's volatility effect, the refining industry could not have achieved EPA's Phase I (1995 to 1999) RFG standards for VOC emissions using only ethanol in RFG. EPA recognized ethanol's effect on gasoline volatility and set Phase I VOC standards that required refiners to meet the lowest achievable gasoline volatility level, based on assessments that assumed refiners would use MTBE, and not ethanol, to meet those standards. Given the additional reduction in volatility that would have been required to meet those standards if refiners used ethanol, EPA set Phase I VOC standards that, by its own assessment, effectively required widespread MTBE use.

12. Both EPA and certain state regulatory authorities expressed concern about ethanol use in RFG. During the development of the RFG regulations, EPA expressed concerns about the impacts on nitrogen oxide (NO_x) and VOC emissions if ethanol were used in summertime RFG. Moreover, certain state regulatory authorities – namely, the New York Department of Environmental Conservation (NY DEC) and the Northeast States for Coordinated Air Use Management (NESCAUM), an association of northeast state air pollution control agencies –

expressed concern about the environmental implications of efforts to increase ethanol use in RFG above anticipated levels, even in winter RFG.

13. **Uncertainty regarding ethanol use in RFG existed until at least 1994.** Together with actions taken by EPA in its RFG rulemaking process, these expressions of concern would have created significant uncertainty for refiners contemplating ethanol use instead of MTBE use in the early 1990s. For example, refiners would not have known the extent of the refinery modifications that would have been necessary to use ethanol instead of MTBE in RFG immediately after the passage of the CAAA because both the RFG emissions standards and EPA's determinations regarding the relationships between fuel characteristics and resulting emissions remained uncertain until the February 1994 final RFG rule. EPA indicated as early as 1991 that it was presuming widespread MTBE use when evaluating the emissions and economic implications of potential standards. The Phase I RFG standards that EPA proposed in April 1992 made clear that EPA would set standards requiring the greatest reductions in emissions that EPA deemed achievable under the presumption of widespread MTBE use.

B. Summary of Opinions Regarding Social Costs of Ethanol Use in RFG

14. **The reports submitted by Mr. Herwick, Mr. Tallett, and Dr. Whitelaw on behalf of the Plaintiff do not provide complete assessments of the social impacts of increased production and use of ethanol, nor do they claim to have provided such complete assessments.** A benefit-cost analysis of policies to encourage ethanol use would consider the full range of benefits and costs of ethanol production and use, including environmental externalities and any other indirect benefits or costs that might result. It would also specify the scenarios that are being compared (e.g., the use of MTBE-blended RFG instead of ethanol-blended RFG) and would measure all benefits and costs in the context of that comparison. Furthermore, it would distinguish between benefits and costs to society and impacts that only represent redistributions (transfers) of welfare among different groups. The reports by Mr. Herwick, Mr. Tallett, and Dr. Whitelaw do not meet these guidelines and should not be interpreted as providing complete assessments of the social impacts of increased production and use of ethanol.

15. The Plaintiff's experts have not provided complete assessments of the environmental costs of ethanol production and use. A complete assessment of the environmental impacts of ethanol would include not just an analysis of emissions characteristics of ethanol-blended RFG but also an analysis of the environmental costs associated with feedstock production, refining, and distribution. For example, ethanol production has significant impacts on water resources. In addition to the water required to grow corn and transform it into ethanol, the pesticides and fertilizers used to grow corn and the wastewater generated in ethanol refining adversely impact water quality.

16. The Plaintiff's experts have not provided complete assessments of ethanol's impact on greenhouse gas (GHG) emissions and energy security. New research on the effects of fertilizers used to grow corn and the effects of worldwide land-use change driven by increased demand for ethanol suggests that the production and use of ethanol may emit more total GHGs than gasoline. Moreover, a number of studies suggest that increased use of ethanol may not significantly improve energy security in the United States. For the most part, however, the comparison drawn in these studies is not directly relevant to this case. Most of these studies compare ethanol to gasoline, not ethanol-blended RFG to MTBE-blended RFG. Given that refiners must offset ethanol's volatility effect when ethanol is used in summer RFG, a process that consumes energy and reduces gasoline volume, EPA itself concluded that the use of ethanol instead of MTBE as an additive to RFG may increase dependence on fossil fuels and increase GHG emissions.

17. The Plaintiff's experts have not provided complete assessments of the economic impacts of ethanol subsidies. The ethanol industry in the United States (as well as in other countries) has long been subsidized. These subsidies constitute a direct cost to taxpayers and may impose indirect costs by encouraging an inefficient allocation of resources. Most notably, increased ethanol use in recent years has been widely cited as a major cause of higher food prices, which impose a substantial cost to the public. The presence of subsidies highlights an economic fact about policies promoting ethanol use – while some sectors gain from those policies, those gains may come at the expense of other sectors in the economy. Benefits to certain sectors in the economy do not necessarily constitute benefits to society as a whole.

Appendix A

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EDUCATION: Ph.D. Harvard University, Economics, June 1988
M.S. Cornell University, Agricultural Economics
B.A. Northwestern University, Philosophy

RESEARCH AND TEACHING FOCUS: Environmental & Natural Resource Economics and Policy

PUBLICATIONS:

Academic Journals

"Addressing Climate Change with a Comprehensive U.S. Cap-and-Trade System." *The Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, pp. 298-321.

"Corporate Social Responsibility Through An Economic Lens." *Review of Environmental Economics and Policy* 2(2008): 219-239. With F. Reinhardt and R. Vietor.

"What Drives Land-Use Change in the United States? A National Analysis of Landowner Decisions." *Land Economics* 84(2008): 529-550. With R.N. Lubowski and A.J. Plantinga.

"A Meaningful U.S. Cap-and-Trade System to Address Climate Change." *Harvard Environmental Law Review* 32(2008): 293-371.

"Climate Policy Architectures for the Post-Kyoto World." *Environment* 50(2008), May, Number 3, pp. 6-17. With J.E. Aldy.

"Water Demand Under Alternative Price Structures." *Journal of Environmental Economics and Management* 54(2007): 181-198. With S.M. Olmstead, and W.M. Hanemann.

"Book Review: Jancis Robinson, Tasting Pleasures — Confessions of a Wine Lover." *Journal of Wine Economics*, Volume 2, Number 1, Spring 2007, pp. 106-108.

"On the Value of Formal Assessment of Uncertainty in Regulatory Analysis." *Regulation and Governance* 1(2007): 154-171. With J. Jaffe.

"Second-Best Theory and the Use of Multiple Policy Instruments." *Environmental and Resource Economics* 37(2007): 111-129. With L.S. Bennear.

"Forecasting the Size Distribution of Farms: A Methodological Analysis of the Dairy Industry in New York State." M.S. thesis, Cornell University, Ithaca, New York, May 1979.

SELECTED PRESENTATIONS:

Presentations at universities, research institutes, Federal and state government agencies, Congressional committees, foreign governments, international organizations, foundations, non-profit groups, corporations, and trade associations, including the following (partial list): American Council on Capital Formation, American Economic Association, American Enterprise Institute, American Paper Institute, American Petroleum Institute, Analysis Group, Association for Public Policy Analysis and Management, Brookings Institution, Canadian Cabinet, Carnegie-Mellon University, CF Industries, Chevron Corporation, Coolidge Center for Environmental Leadership, Cornell University, Democratic Leadership Council, Eisenhower Exchange Fellowships, Environmental Law Institute, Environmental Defense Fund, Environmental and Energy Study Institute, Executive Office of the President, Ford Foundation, Foundation for American Communications, Georgia Conservancy, Harvard School of Public Health, Harvard College, Harvard Committee on University Resources, Harvard Institute for International Development, Harvard Law School, Harvard-Japan Energy and Environment Workshop, Harvard-Repsol Conference, Heinz Family Endowments, Intergovernmental Panel on Climate Change, International Public Economics Congress, John F. Kennedy School of Government, Jones, Day, Reavis & Pogue, Lincoln Institute of Land Policy, Massachusetts Institute of Technology, McKinsey & Company, McKinsey Global Institute, Mexican Cabinet, Missouri Department of Natural Resources, Morgan Stanley & Company, National Bureau of Economic Research, National Recycling Congress, Northwestern University, Pew Charitable Trusts, Polish Ministry of Environment, Political Economy Research Center, President's Council of Economic Advisers, Princeton University, Progressive Policy Institute, Rand Corporation, Reason Foundation, Resources for the Future, Rockefeller Foundation, Royal Institute for International Affairs, Scripps Institution of Oceanography, Smithsonian Institution, St. Lawrence University, Stanford University, U.S. House of Representatives, U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Department of the Interior, U.S. Department of State, U.S. Office of Management and Budget, U.S. Senate, U.S. Army Corps of Engineers, University of California (Berkeley, Los Angeles, and Santa Barbara), University of Maryland, University of Michigan, University of Texas, University of Toronto, Vermont Agency of Natural Resources, Vermont Law School, W. Alton Jones Foundation, the White House, the World Bank, the World Economic Forum (Davos), and Yale University.

PROFESSIONAL EXPERIENCE:

Albert Pratt Professor of Business and Government, John F. Kennedy School of Government, Harvard University, 1998-present (Professor of Public Policy, 1997-1998; Associate Professor, 1992-1997; Assistant Professor, 1988 - 1992).

Director, Harvard Environmental Economics Program, 2000 - present.

Chairman, Environment and Natural Resources Faculty Group, John F. Kennedy School of Government, Harvard University, 1999-present.

Director of Graduate Studies for Doctoral Program in Public Policy and Doctoral Program in Political Economy and Government, Chairman of the Kennedy School Ph.D. Committee, and Chairman of the Graduate School of Arts and Sciences (GSAS) Standing Committee on Higher Degrees in Public Policy, 2006 - present.

Co-Chair, Harvard Business School-Kennedy School Joint Degree Programs, 2007 - present.

University Fellow, Resources for the Future, Washington, D.C., 1989 - present.

Research Associate, National Bureau of Economic Research, 2007 - present.

Editor, *Review of Environmental Economics and Policy* (Oxford University Press), 2006 - present.

Member, Board of Directors, Resources for the Future, Washington, D.C., 2003 - present.